

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Patent Application of:  
Man Chee Kenneth Cheung et al.

Application No.: 10/648,158

Confirmation No.: 3550

Filed: August 25, 2003

Art Unit: 3733

For: DEVICE FOR GRADUAL CORRECTION  
OF SPINAL DEFORMITIES

Examiner: R. R. Shaffer

**AMENDMENT IN RESPONSE TO FINAL OFFICE ACTION**

MS AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

In response to the Office Action dated February 6, 2007, please amend the above-identified U.S. patent application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 3 of this paper.

**Remarks/Arguments** begin on page 6 of this paper.

## FEE CALCULATION

Any additional fee required has been calculated as follows:

|   | Claims<br>Remaining<br>After<br>Amendment | Highest<br>Number<br>Previously<br>Paid | Number<br>Extra<br>Claims<br>Present | Rate     | Additional<br>Fee |
|---|---|---|--------------------------------------|----------|-------------------|
| Total   | 19  | - 31* =                                 |                                      | X 50.00  |                   |
| Independent   | 2   | - 3** =                                 |                                      | X 200.00 |                   |
| First presentation of Multiple Dependent Claim(s) (if applicable) |   |   |                                      |          |                   |
| <b>TOTAL</b>  |   |   |                                      |          | <b>\$ 0.00</b>    |

\*not less than 20

\*\* not less than 3

In the event a fee is required or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-2215.

## CONTINGENT EXTENSION REQUEST

If this communication is filed after the shortened statutory time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 CFR 1.136(a), to extend the time for filing a response to the outstanding Office Action by the number of months which will avoid abandonment under 37 CFR 1.135. The fee under 37 CFR 1.17 should be charged to our Deposit Account No. 50-2215.

**AMENDMENTS TO THE CLAIMS**

Claims 1 - 19 (Cancelled).

20. (Currently Amended) A method of providing a constant or substantially constant force for correcting spinal deformities, the method comprising:

providing a correction force having a predetermined amount, the correction force being generated by a superelastic material; and

maintaining the correction force at the predetermined amount until the spinal deformities are fully or substantially fully corrected;

wherein the correction force is constant or substantially constant during spinal deformity correction.

21. (Original) The method of claim 20, wherein the predetermined amount of the correction force can be adjusted.

22. (Original) The method of claim 20, wherein the correction force is activated during the spine correction surgery.

Claims 23 - 27 (Cancelled).

28. (Original) The method of claim 20, wherein the correction force is applied to the deformed spine portion from the anterior aspect of the spine.

29. (Original) The method of claim 20, wherein the correction force is applied to the deformed spine portion from the posterior aspect of the spine.

Claims 30 - 31 (Cancelled).

32. (Currently Amended) The method of claim 20, ~~further comprising pre-~~  
~~contouring the~~ wherein the superelastic material forms a correction device to assume the  
normal kyphosis and lordosis of the spine.

33. (Currently Amended) The method of claim [[20]] 32 further comprising  
deforming the correction device to conform to the portion of the spine to be corrected.

34. (Currently Amended) The method of claim [[20]] 32 further comprising  
limiting the correction device from movement.

35. (Currently Amended) The method of claim [[20]] 32 further comprising  
limiting the correction device from a rotation movement.

36. (Currently Amended) A method of providing a constant or substantially  
constant force for correcting spinal deformities, the method comprising:

providing a supporting member comprising a superelastic material for  
generating a correction force having a predetermined amount; and

maintaining the correction force at the predetermined amount until the spinal  
deformities are fully or substantially fully corrected;

wherein the supporting member generates the correction force at body  
temperature without using external heating source.

37. (Previously Presented) The method of claim 36 further comprising  
deforming at least a portion of the supporting member to conform to the spinal  
deformities.

38. (Previously Presented) The method of claim 36, wherein the predetermined amount of the correction force can be adjusted.

39. (Previously Presented) The method of claim 36, wherein the correction force is activated during the spine correction surgery.

40. (Previously Presented) The method of claim 36 further comprising pre-contouring the supporting member to assume the normal kyphosis and lordosis of the spine.

41. (Previously Presented) The method of claim 36 further comprising limiting the supporting member from movement.

42. (Previously Presented) The method of claim 36 further comprising limiting the supporting member from a rotation movement.

43. (Previously Presented) The method of claim 36 further comprising providing an anchor member for mounting the supporting member to the deformed spine portion.

44. (Previously Presented) The method of claim 43, wherein the anchor member comprises a superelastic material.

45. (Previously Presented) The method of claim 43, wherein the anchor member comprises a pseudoelastic material.

### REMARKS

Claims 20-22, 28-29, and 32-45 are pending in this case. Claims 1-19, 23-26, and 30-31 have been cancelled in view of the prior Restriction Requirement and claims 23-27 have been cancelled without prejudice. Claims 19 and 32-36 have been amended to advance prosecution of the subject application. Applicants respectfully request that the subject application be reconsidered in view of the above claim amendments and the following remarks.

Claims 20-22, 28, 29 and 32-45 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Sanders et al. (US 5,290,289). This rejection is respectfully traversed.

Independent claim 20 recites a method of correcting spinal deformities, in which "the correction force is constant or substantially constant during spinal deformity correction." The cited portions of Sanders do not teach the above features.

The Office action states that "[i]n regard to Sanders et al supposedly not disclosing a "constant force," ... the limitation is not found in the claim." (Page 4 of Office action.) Applicants respectfully disagree.

As is previously presented, independent claim 20 recites "[a] method of providing a constant or substantially constant force for correcting spinal deformities." As such, the correction force in independent claim 20 is "constant or substantially constant." Because the cited portions of Sanders do not teach a "constant force" as conceded in the Office action, the previously presented claim 20 patentably distinguishes over Sanders.

To advance the allowance of the subject application, independent claim 20 now recites in the claim body that "the correction force is constant or substantially constant."

Because Sanders does not teach such features, the subject rejection of independent claim 20 and its dependent claims 21-22, 28-29, and 32-35 is believed to have been overcome.

Independent claim 36 recites that “the supporting member generates the correction force at body temperature without using external heating source.” Sanders, on the other hand, teaches using a radio frequency induction heater and does not teach the temperature at which correction force is generated. Therefore, Sanders does not teach the above claim features in independent claim 36. Accordingly, the subject rejection of independent claim 36 and its dependent claims 37-45 is believed to have been overcome.

Claims 20-22, 28, 29 and 32-43 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Cool et al. (EP 0 470 660 A1). This rejection is respectfully traversed.

Independent claims 20 and 36 each require that the correction force be generated by a superelastic material. The cited portions of Cool do not teach the above claim features.

In contrast, Cool teaches correcting the shape of a spinal column using a rod consisting of a shape memory material (col. 1, ll. 1-6), rather than a superelastic material as recited in independent claims 20 and 36. Therefore, Cool does not teach the above features in independent claims 20 and 36. Accordingly, the subject rejection of independent claims 20 and 36 and their dependent claims 21-22, 28-29, 32-35, and 37-45 is believed to have been overcome.

Claims 20-22, 28, 29, and 32-45 are rejected under 35 U.S.C. § 102(e) as being anticipated by Drewry et al. (US 6,783,527). This rejection is respectfully traversed.

As submitted above, independent claim 20 recites a method of correcting spinal deformities, in which “the correction force is constant or substantially constant

during spinal deformity correction.” The cited portions of Drewry do not disclose the above claim features.

The Office action concedes that “[Drewry does] not explicitly stat[e] a constant force,” but asserts that “since the tether (80) is effectively a spring, it is an inherent physical property to which springs act with a constant force.” (Page 5 of Office action.) Applicants respectfully disagree.

Regardless whether Drewry teaches its elongate member 80 being a spring, applicants wish to clarify that spring does not produce constant force over the range of extension or contraction. According to Hooke's law, the force with which a spring pushes back is linearly proportional to the distance from its equilibrium length (*i.e.*,  $F = -kx$ ). Therefore, it is expected that the force produced by spring is linear to its elongated distance and is not a constant force.

In view of the above, Drewry does not teach the above claim features in independent claim 20. Therefore, the subject rejection of independent claim 20 and its dependent claims 21-22, 28-29, and 32-35 is believed to have been overcome.


Independent claim 36 further recites that “the supporting member generates the correction force at body temperature without using external heating source.” Although the Office action states that the elongated members 80 in Drewry are inherently activated by heat, the cited portions of Drewry are silent as to the above claim features in independent claim 36. More specifically, Drewry is directed to a spinal stabilization system for stabilizing the vertebral column, rather than a correction device. The cited portions of Drewry do not teach that the elongated members 80 generate correction forces at body temperature, much less constant correction forces, for correcting spinal deformities. Therefore, the subject rejection of independent claim 36 and its dependent claims 37-45 is believed to have been overcome.



Applicants have shown that claims 20-22, 28-29, and 32-45 are patentable over the cited art and hereby respectfully request that the rejections of these claims be withdrawn. Each of these pending claims in this application is thus believed to be in immediate condition for allowance and such action is earnestly solicited.

Respectfully submitted,

Dated: May 7, 2007

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